

WHAT IS CLAIMED IS:

1 1. A method for producing porous Group III-V material, the
2 method comprising steps of:

3 depositing a thin discontinuous layer of metal on a Group III-V
4 material surface;

5 etching the Group III-V material surface in a HF and oxidant
6 solution, said etching being conducted without external electrical bias.

1 2. The method according to claim 1, wherein said step of
2 etching is conducted in the absence of illumination.

1 3. The method according to claim 1, wherein said step of
2 etching is conducted in the presence of illumination.

1 4. The method according to claim 1, wherein said metal
2 comprises Pt.

1 5. The method according to claim 1, wherein said metal
2 comprises Au.

1 6. The method according to claim 1, wherein said metal
2 comprises Pd.

1 7. The method according to claim 1, wherein said metal
2 comprises a combination of metals selected from the group of Au, Pt and Pd.

1 8. The method according to claim 1, wherein said oxidant
2 comprises H₂O₂.

1 9. The method according to claim 1, wherein the thickness of
2 said metal is less than approximately 10nm.

1 10. The method according to claim 1, wherein said etching is
2 conducted for a time period between about 2 seconds and one hour.

1 11. The method according to claim 1, wherein said Group III-V
2 material comprises GaN.

1 12. A method for producing porous Group III-V material, the
2 method consisting of the following steps:

3 depositing a thin discontinuous layer of metal on a Group III-V
4 material surface;

5 etching the Group III-V material surface in a HF and oxidant
6 solution for a period of about two seconds up to 60 minutes.

1 13. The method according to claim 12, wherein said step of
2 etching is conducted in the absence of illumination.

1 14. The method according to claim 12, wherein said step of
2 etching is conducted in the presence of illumination.

1 15. The method according to claim 12, wherein said metal
2 comprises Pt.

1 16. The method according to claim 12, wherein said metal
2 comprises Au.

1 17. The method according to claim 12, wherein said metal
2 comprises Pd.

1 18. The method according to claim 12, wherein said metal
2 comprises a combination of metals selected from the group of Au, Pt and Pd.

1 19. The method according to claim 12, wherein said oxidant
2 comprises H₂O₂.

1 20. The method according to claim 12, wherein the thickness of
2 said metal is less than approximately 10nm.

1 21. The method according to claim 12, wherein said etching is
2 conducted for a time period between about 2 seconds and one hour.

1 22. The method according to claim 12, wherein said Group III-V
2 material comprises GaN.

1 23. A method for producing porous Group III-V material, the
2 method comprising steps of:

3 depositing metal on a Group III-V material surface in a thickness
4 sufficient to permit nucleation that forms nanometer size metal particles and small
5 enough to prevent formation of a continuous metal layer;
6 etching the Group III-V material surface in a HF and oxidant
7 solution for a period of about two seconds up to 60 minutes, said etching being
8 conducted without external electrical bias.